Roadway Visibility

Tangible Result Driver – Don Hillis, Director of System Management

Good roadway visibility in all weather and light conditions is critical to safe and efficient travel. MoDOT will delight its customers by using top-quality and highly visible stripes and signs.

Roadway Visibility

Rate of nighttime crashes

Result Driver: Don Hillis, Director of System Management
Measurement Driver: Michael Curtit, Assistant State Traffic Engineer

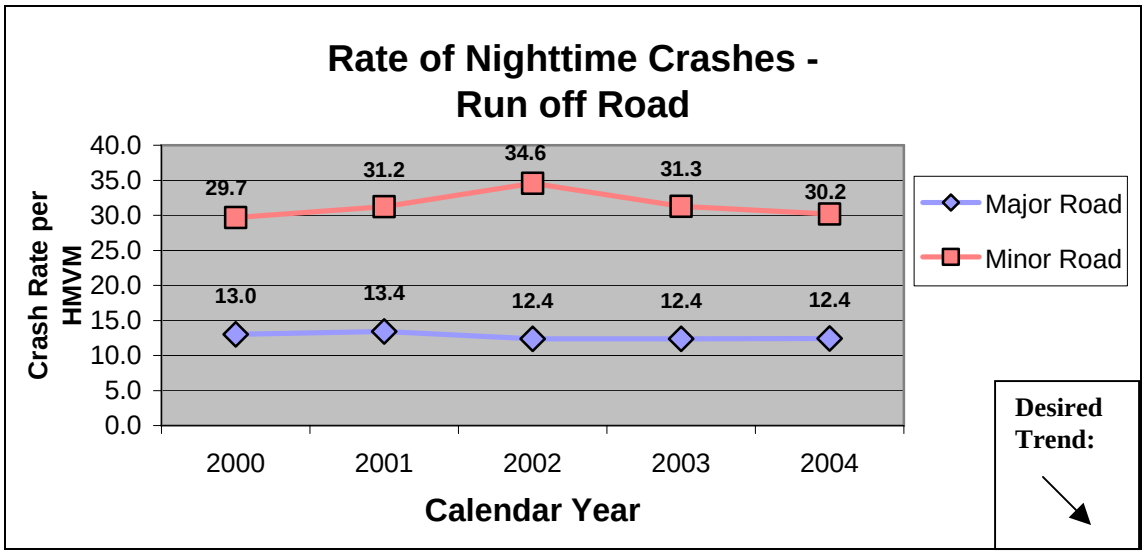
Purpose of the Measure:
This measure tracks the types of crashes where visibility of stripes and signs may be a contributing factor.

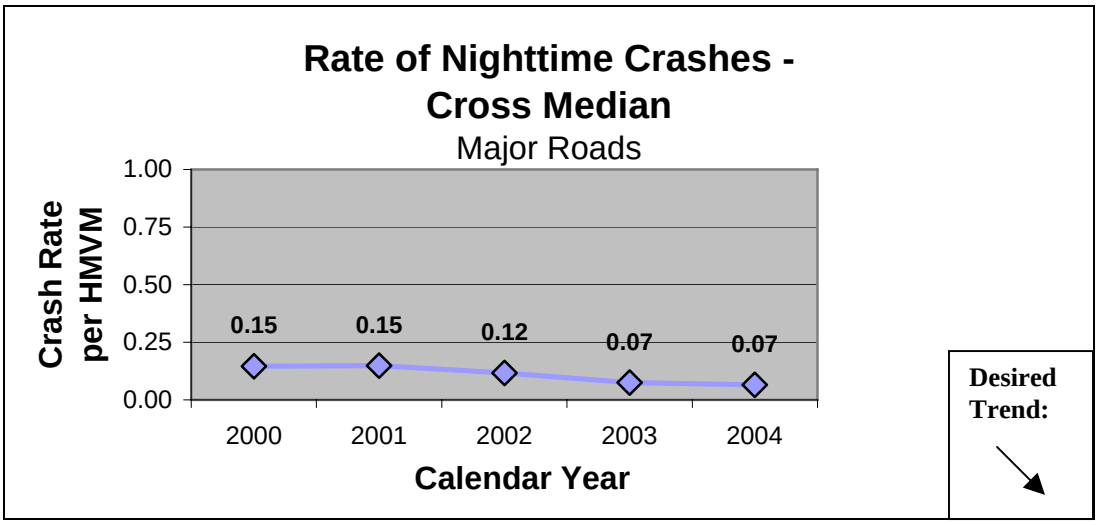
Measurement and Data Collection:
Data is collected from the statewide crash database. This data is filtered to identify crashes that occur during night conditions. Further filtering of the data divides these night crashes by major and minor roadways. Major roadways are those that are used generally for statewide or interstate travel. Minor roadways are those used typically for local traffic needs. Crash rates are calculated using the Average Annual Daily Traffic counts and are expressed in the unit, per 100 million vehicle miles (HMVM), which is the national standard for expressing crash rates.

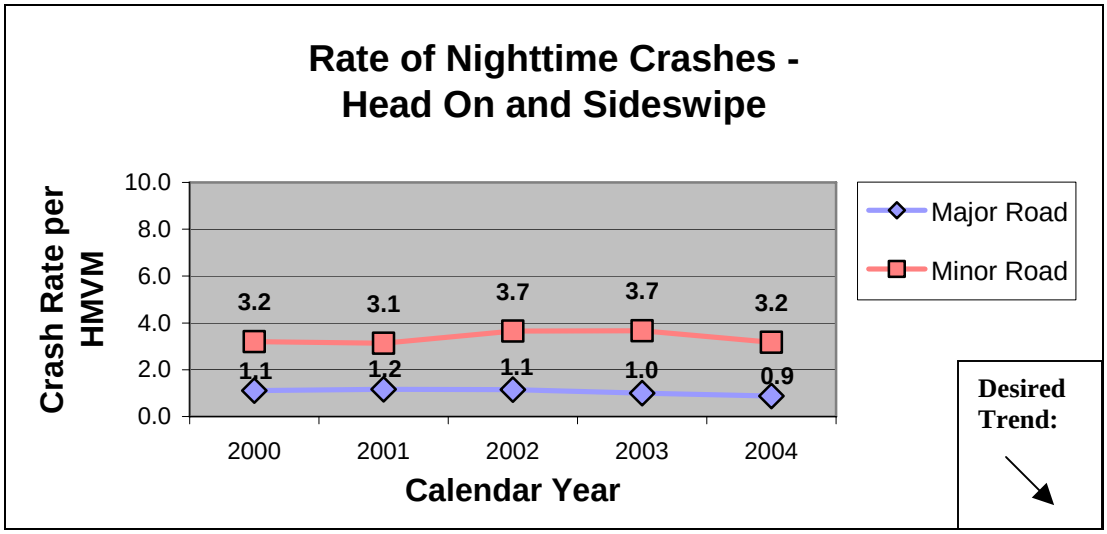
Improvement Status:

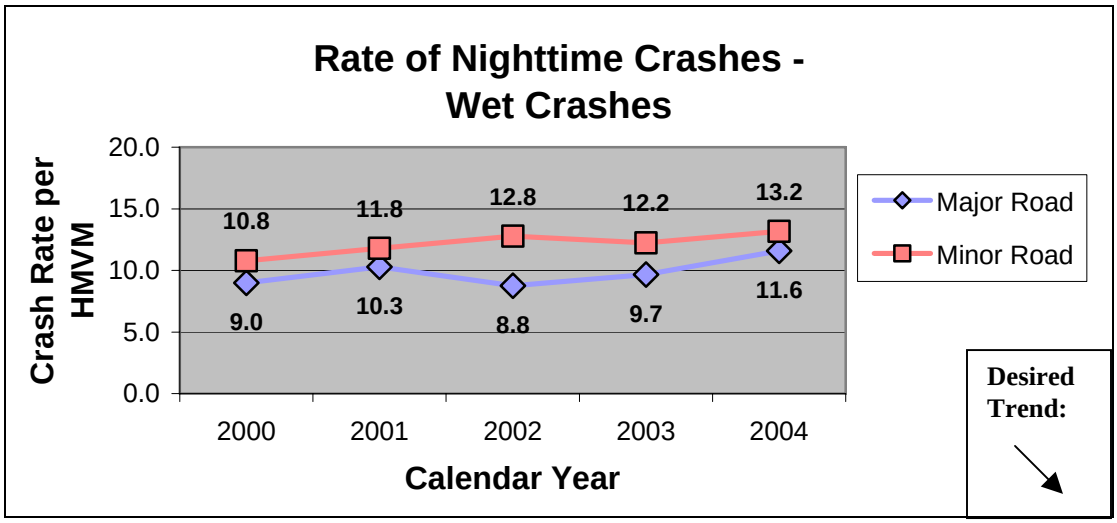
Three crash types (run off road, cross median, and head on/sideswipe) had a slight decrease from the previous year's rate. Major roads had a slightly decreasing trend over the previous five years. Minor roads had virtually a flat trend. There has been a decline in night – run off road crashes since 2002, which corresponds to the time frame where edgeline striping was installed on additional lower-volume roads.

The fourth crash type, nighttime wet crashes, has increased for both major and minor roads. In 2005, MoDOT implemented a new pavement marking system to improve the visibility during nighttime, wet conditions. On major roads this new system includes highly reflective pavement marking tape, edgeline rumble stripes, and delineation of guardcable and guardrail.




Rate of Nighttime Crashes -
Cross Median
Major Roads
Crash Rate per HMVM
1.00
0.75
0.50
0.25
0.00
0.15
0.15
0.12
0.07
0.07
2000
2001
2002
2003
2004
Calendar Year
Desired Trend:


Rate of Nighttime Crashes -
Head On and Sideswipe
Crash Rate per HMVM
10.0
8.0
6.0
4.0
2.0
0.0
3.2
3.1
3.7
3.7
3.2
1.1
1.2
1.1
1.0
0.9
Major Road
Minor Road
2000
2001
2002
2003
2004
Calendar Year
Desired Trend:


Rate of Nighttime Crashes -
Wet Crashes
Crash Rate per HMVM
20.0
15.0
10.0
5.0
0.0
10.8
11.8
12.8
12.2
13.2
9.0
10.3
8.8
9.7
11.6
Major Road
Minor Road
2000
2001
2002
2003
2004
Calendar Year
Desired Trend:

Roadway Visibility

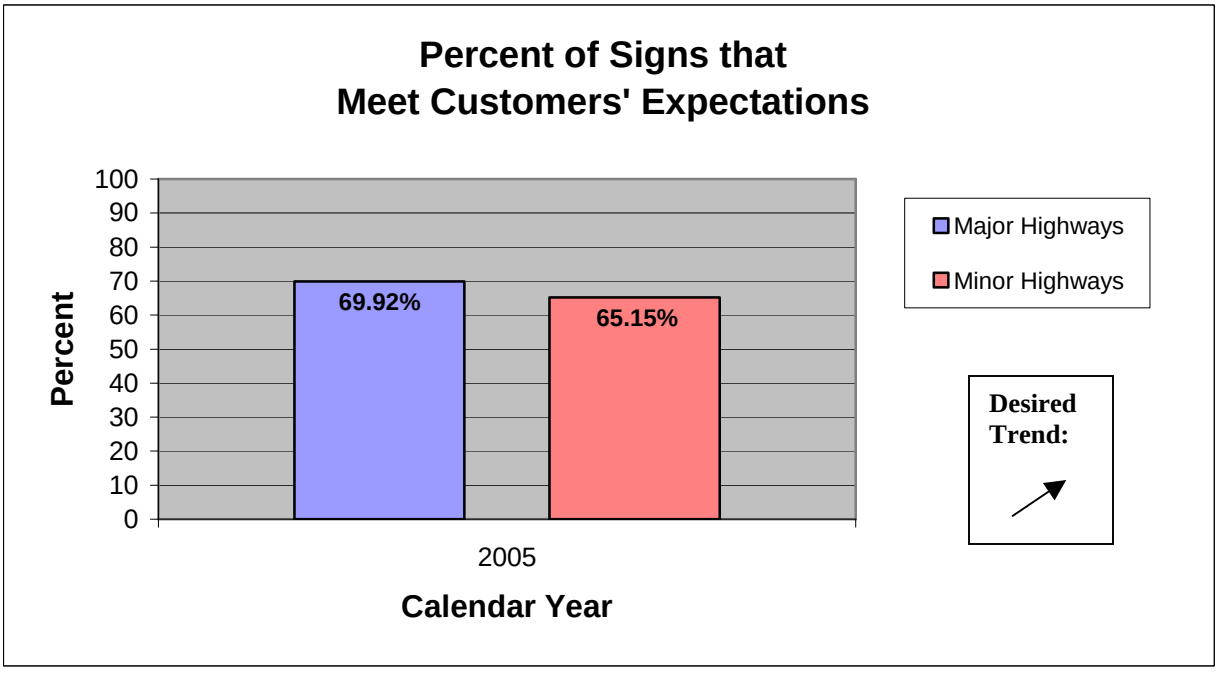
Percent of signs that meet customers' expectations

Result Driver: Don Hillis, Director of System Management
Measurement Driver: Jim Brocksmith, Technical Support Engineer

Purpose of the Measure:
This measure will track whether the department's sign policy and the design standards, and sign replacement policy is resulting in visible signs that meet customers' expectations.

Measurement and Data Collection:
Sign-quality attributes that define user expectations have been developed based on an industry-wide literature review. The attributes selected for this measure are those that can be captured during a night sign log. A night sign log is conducted by MoDOT employees driving a road at night, recording the location and condition of the signs, particularly how visible the signs are with normal headlights. Data for this measure is collected by doing night sign logs on randomly generated road segments. The data collection is done annually in the fall by MoDOT employees.

Improvement Status:
The data shows that almost 70 percent of the signs on the major highways and 65 percent on the minor highways are meeting customer expectations. The majority of sign problems indicate that they need to be replaced with new signs that are visible at night. The Smooth Roads Initiative is replacing many of the signs on the major roads. This effort is continuing and should lead to an improvement in the results on the major highways. On the minor roads, MoDOT will need to make greater efforts to maintain signs. With the 10-year replacement program that MoDOT has proposed, this will improve the results on both the major and minor roads.



Roadway Visibility

Percent of stripes that meet customers' expectations

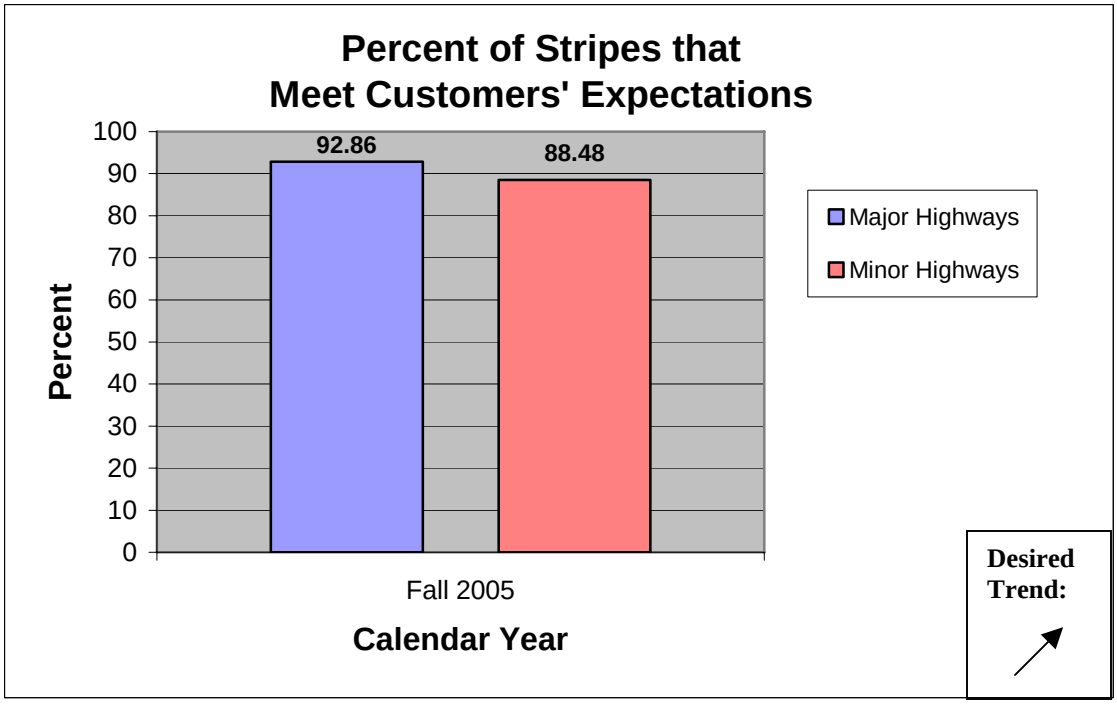
Result Driver: Don Hillis, Director of System Management
Measurement Driver: Jim Brocksmith, Technical Support Engineer

Purpose of the Measure:
This measure tracks whether MoDOT's striping policy, processes and materials used are resulting in visible stripes that meet customers' expectations.

Measurement and Data Collection:
Striping quality attributes that define user expectations have been developed based on an industry-wide literature review. The attribute selected for this measure is the retroreflectivity of the striping that measures the functionality of the striping at night. Retroreflectivity is a measurement of the amount of the vehicle headlights that is being returned to the driver, making the striping visible at night. Data for this measure is collected by taking retroreflectivity readings on randomly generated road segments. MoDOT has a contractor collecting this data. The data will be collected in the fall and spring of each year. This will tell us how our striping is performing going in to the winter and how it is performing after the winter.

Improvement Status:
The data collected from the contractor was analyzed in respect to the benchmarks MoDOT set as the minimum acceptable level of retroreflectivity, which measures the night visibility of the striping. These readings were taken before all striping for the 2005 striping season was completed, therefore the final results going in to the winter should be slightly higher than what is indicated. For the majority of our roads, the striping is in good shape heading into winter, which is the hardest time for wear on striping.

MoDOT has implemented a new plan for striping to improve visibility. This plan increases the width of striping on major roads to six inches wide, the use of highly retroreflective tape on the skips of major divided highways and the use of longer-lasting materials, which will improve the life and appearance of the striping. When the plan is fully implemented, the results indicated in the chart will improve.



Roadway Visibility

Percent of work zones meeting expectations for visibility

Result Driver: Don Hillis, Director of System Management
Measurement Driver: Scott Stotlemeyer, Technical Support Engineer

Purpose of the Measure:
An important factor in evaluating the department's performance in temporary traffic control design, deployment, operation, and maintenance is the measurement of the effectiveness of the visual guidance provided to the highway user traveling through our work zones. This measure tracks how well the department meets its customer expectations of visibility in work zones on state highways.

Measurement and Data Collection:
Using a formal inspection worksheet, staff from Construction and Materials, Maintenance, Traffic and the districts evaluate visibility of construction, MoDOT, and permit work zones across the state. Each evaluation consists of a subjective assessment of engineered and operational factors affecting visibility. The evaluator assigns a pass, fail, or n/a rating to each of these individual factors and a pass or fail rating for their overall perception of the work zone visibility. The overall perception ratings are compiled quarterly and reported via this measurement. Note: The inspection program began June 2005. A total of 625 inspections (144 in June 2005, 310 in first quarter FY 2006, and 171 in second quarter FY 2006) have been completed since its inception.

Improvement Status:
The percent of work zones meeting visibility expectations decreased slightly (-1.5 percent) this past quarter. The lower percentage does not reflect a relaxation in MoDOT's desire to provide exemplary work zones. Rather, it provides the department with a better baseline of where we are now and identifies opportunity for improvement. Department staff continue to enhance work zone visibility guidance and convey those expectations to contractors, employees, and permittees. As this information becomes part of the culture for those who design, build, and maintain the state's highway system, we expect the percentage reported in this measure to increase.